Wallops Mission 2000
Status Review

June 18, 1998

Background

- **Wallops Mission 2000 chartered by the Administrator in response to planned changes to Wallops activities**
  - **Sounding Rocket Program restructuring**
  - **Consolidated Space Operations Contract**
  - **Aircraft consolidation**

- **Wallops Mission 2000 intended to provide long-term strategy for Wallops**

- **Wallops Mission 2000 Implementation Plan chartered by the GSFC Center Director to provide details for**
  - **Changes within Wallops ongoing activities**
  - **New Wallops programs**
  - **Manpower impacts**
  - **Transition plans**
  - **New business strategies**

Wallops Flight Facility

"Fast, low cost, flexible and safe response since 1945"

Wallops Mission 2000

Vision

Wallops Flight Facility will be a national resource for providing low-cost integration, launch, and operation of suborbital and small orbital payloads.

Mission

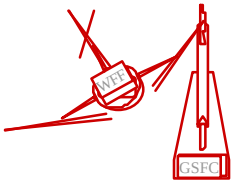
To further scientific, educational and economic advancement by providing the facilities and expertise to enable frequent flight opportunities for a diverse customer base

Key Mission Elements

Suborbital Program
Low-Cost Orbital Missions
Operational Test Facilities
Commercial Development
Educational Outreach

Wallops Flight Facility

"Fast, low cost, flexible and safe response since 1945"



Wallops Mission 2000 Goals

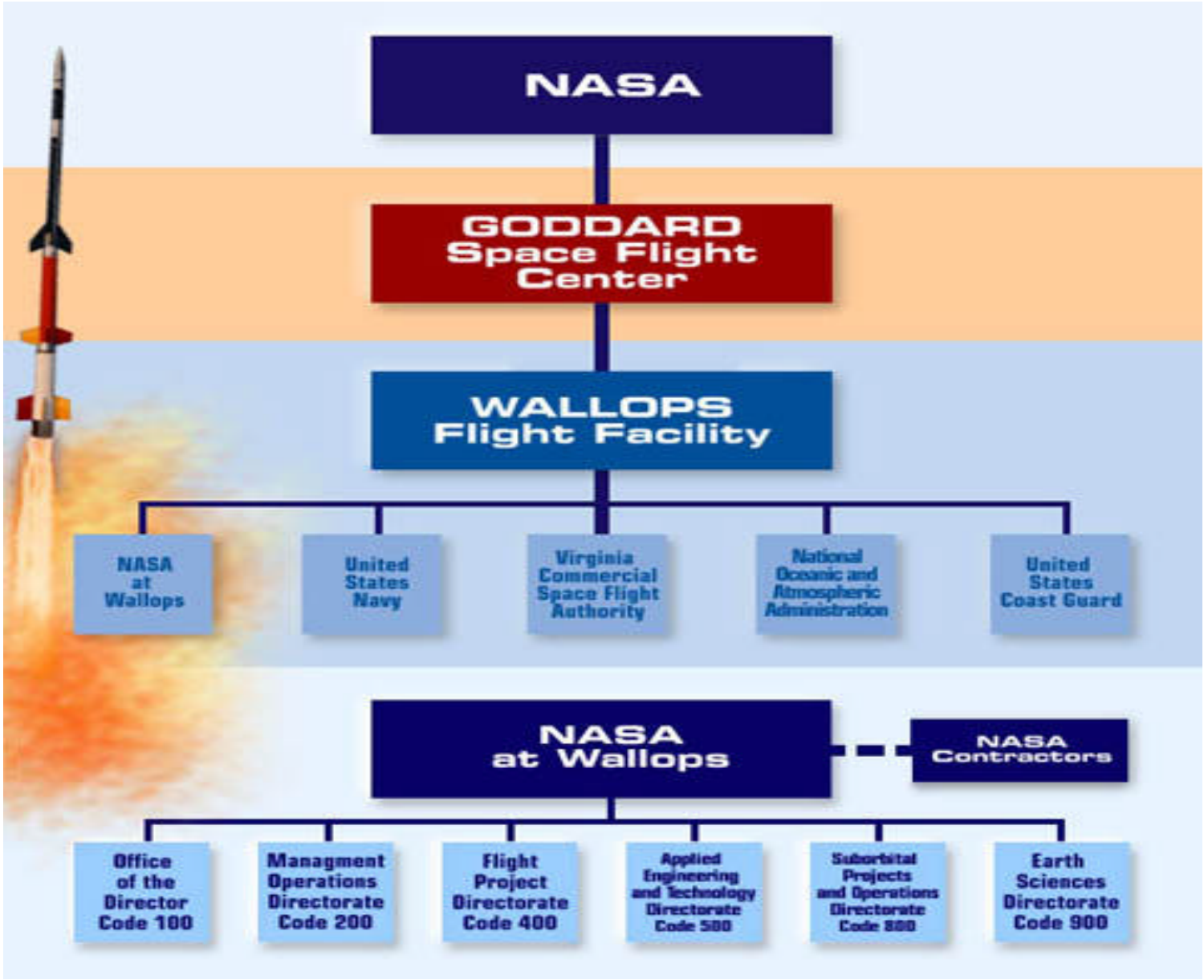
- ***Wallops Flight Facility will be established as an integral element in achieving NASA's strategic objectives for scientific and educational excellence through Cost-efficient integration, launch, and operations of suborbital and small orbital payloads.***

- ***Wallops will serve as a key facility for operational test, integration, and certification of NASA, and commercial next-generation, low-cost orbital launch technologies.***

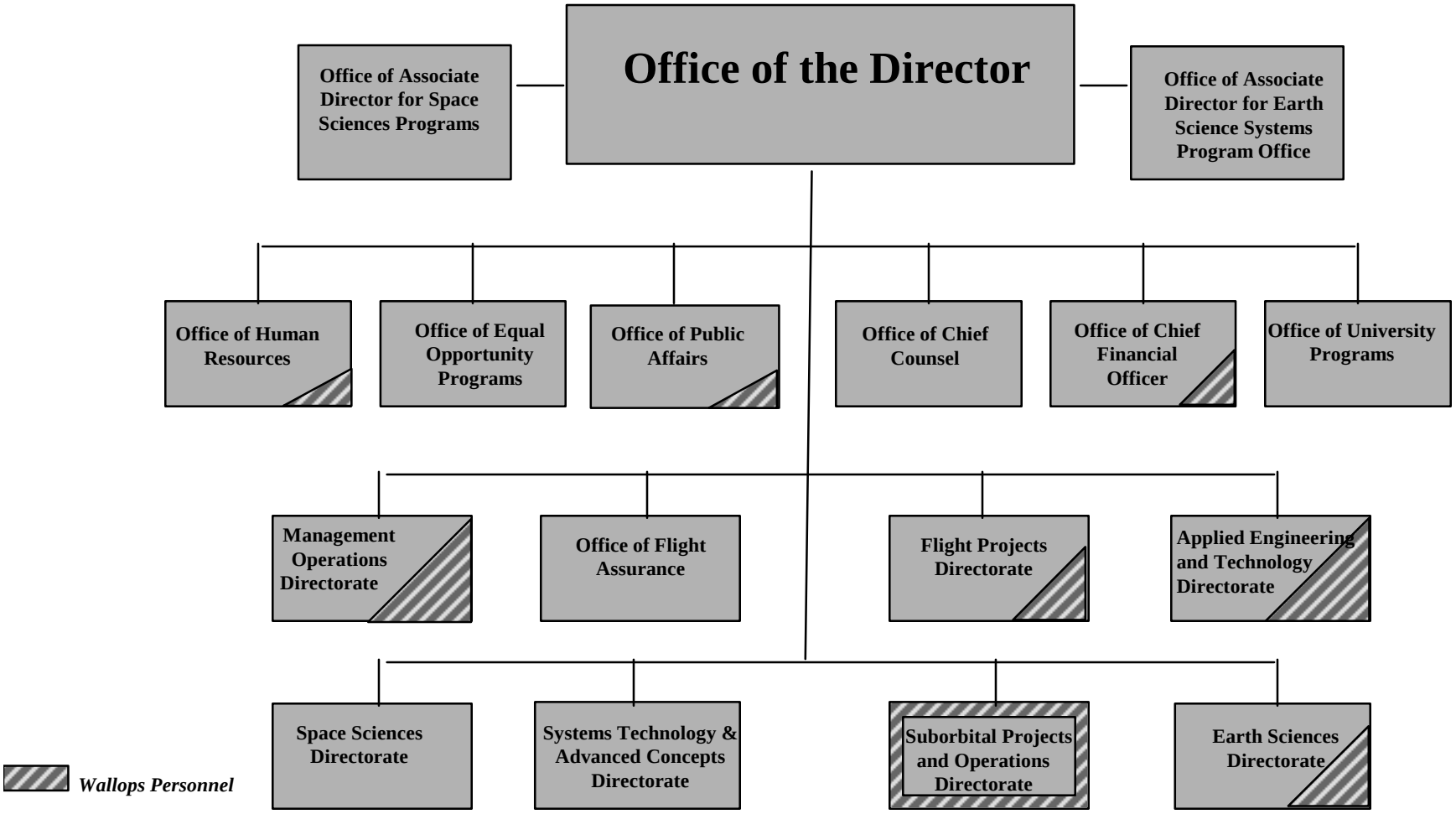
- ***Wallops will be recognized as a role model for pioneering productive and innovative government, industry, and academic partnerships.***

Goddard Space Flight Center / Wallops Flight Facility

ORGANIZATION



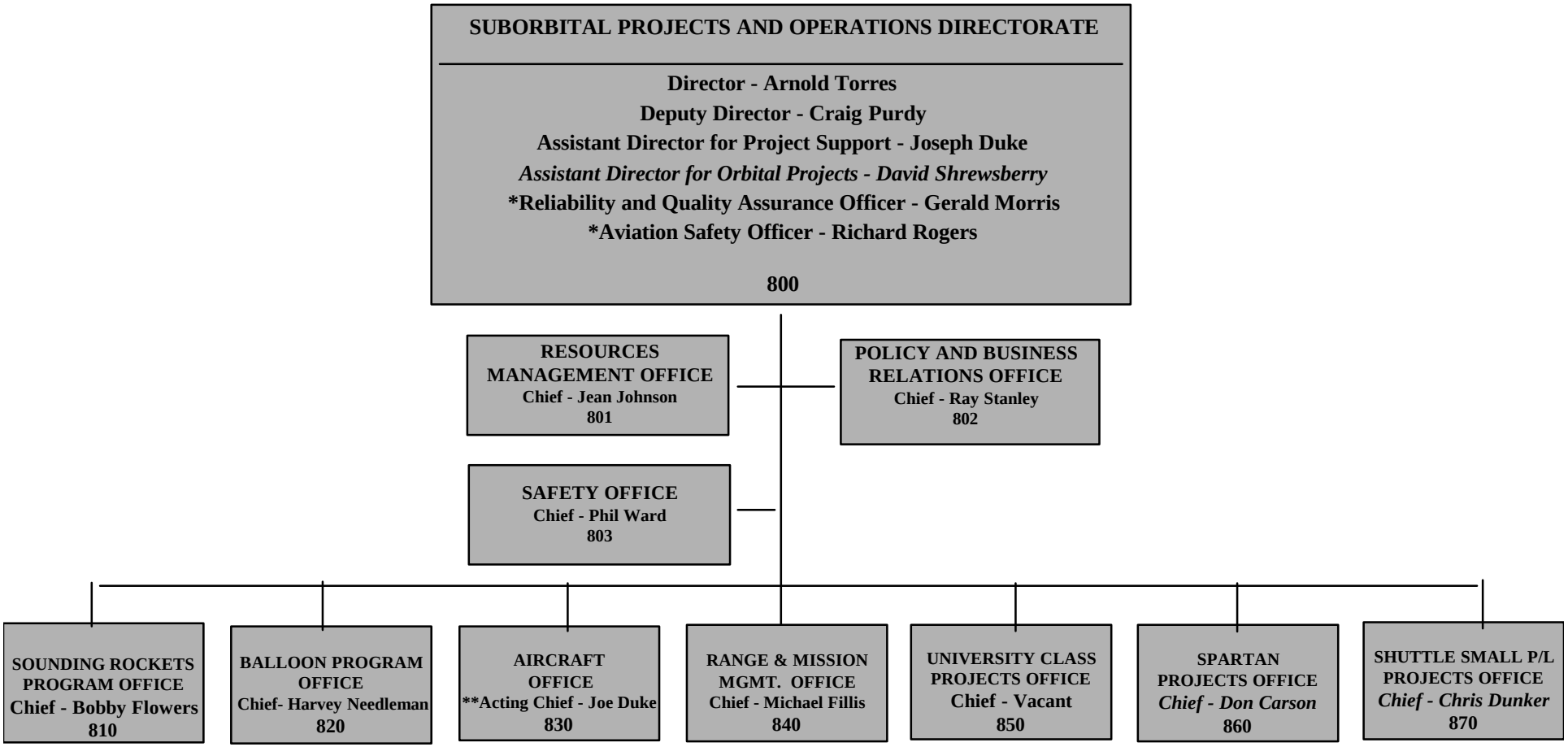
Goddard Space Flight Center



Goddard Space Flight Center / Wallops Flight Facility

ORGANIZATION

The Suborbital Projects and Operations Directorate mission is to provide the full range of services which allow our customers to conduct science and technology experiments from space or within the atmosphere. These services provide the spacecraft development, carrier vehicles, and operational support for suborbital, small orbital, and atmospheric projects.



***Collateral Assignment **Acting**

Italics represents employees located at Greenbelt

Sounding Rocket Program Office

The Sounding Rocket Program Office manages the implementation of the NASA Sounding Rocket Program on behalf ot the Office of Space Science. This Program annually manages the design, development, integration and testing, and launch operations of 25-30 missions from numerous fixed and mobile launch sites worldwide.

Mission 2000 Related Activities	***Status***
•Develop larger customer base	- 7 new DoD missions scheduled - Microgravity project plan developed for MSFC - Other NASA and DoD mission prospects being pursued
•Implement NSROC contract	- Proposals received 4/98 - Selection 9/98 - Implementation begins by 11/98
•Investigate movement of launches from WSMR to WFF Test Range	- Study team being established to address technical issues
•Pursue new system technologies	- Plans under development for pursuing new technologies

Balloon Program Office

The Balloon Program Office manages the implementation of the NASA Balloon Program on behalf of the Office of Space Science. The Office manages a performance-based engineering and operations contract for mission implementation and the research and development of new technologies related to scientific ballooning.

Mission 2000 Related Activities	***Status***
•Implement new PBC contract	- Contract awarded to PSL during 3/98
•Develop Ultra Long Duration Ballooning capability (100 days)	- Project team in place - System Definition Review completed 3/98 - PDR scheduled for 10/98
•Investigate planetary missions	- Dialog and studies ongoing with JPL for Mars missions

Aircraft Office

The Aircraft Office is responsible for the management of and operation of the NASA aircraft resident at Wallops Flight Facility. The fleet presently consists of 3 science aircraft which support the Earth Science Enterprise. The Office also manages and operates the range aircraft, and NASA 8 administrative aircraft.

Mission 2000 Related Activities	***Status***
•Transfer T-39, UH-1, and C-130	- UH-1 retired - T-39 to be retired at end of FY98 - C-130 continues to be manifested by Code Y
•Reduce costs through cost sharing	- Agreement implemented with Pax River for F-27 cost sharing - Code M to share costs of C-130

Range and Mission Management Office

The Range and Mission Management Office is responsible, through the organizational matrix, for providing project managers for Wallops Code 800 projects. This Office is also responsible for management of the Wallops Test Range (Fixed Launch Range, Mobile Range, and Research Airport), which supports all NASA enterprises, other government organizations, academia, and commercial entities.

Mission 2000 Related Activities	***Status***
•Increase customer base	- New DoD suborbital missions scheduled - Aberdeen Proving Ground established as regular customer - Numerous other prospects being pursued
•Support NASA next-generation launch technology efforts	- X-33 mobile instrumentation support planned - X-34 mobile instrumentation and airport support expected - Bantam program not expected to be funded. (3 of 4 candidates planned use of Wallops)
•Increase support for NASA science missions	- Wallops included as launch site option in SELVS II RFP - Increased sounding rocket missions planned

Range and Mission Management Office (cont'd)

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Mission 2000 Related Activities	***Status***
•Support establishment of the Virginia Commercial Space Flight Authority	- GSFC agreements signed 5/98 - Launch Pad 0B construction underway - Regular discussions concerning potential commercial missions
•Consolidate contracts	- Instrumentation/Control Center functions moved to CSOC - Residual contractors consolidated with other WFF technical contracts in upcoming RFP. PDT established with Codes 200 and 800.
•Make Research Airport self-supporting	- Annual O&M funded being collected from users - Funding discussions ongoing with tenants - Several major new D-1 tenant prospects being discussed
•Consolidate aircraft operations into one hangar	- Consolidation completed - Hangar D-1 mothballed. Available for reimbursable customers.

University Class Projects Office

The University Class Projects Office is responsible for management of NASA small spacecraft projects assigned to Code 800. This office is presently responsible for management of University Explorer (UNEX) missions and is expected to manage the proposed University Earth Science (UNES) missions.

Mission 2000 Related Activities	***Status***
•Support upcoming UNEX activities	- UNEX AO proposals received 3/98 - Selections expected 9/98 - Greenbelt and Wallops services included in AO
•Support development of UNES	- Discussions ongoing with Code 170

Spartan Projects Office

The Spartan Projects Office provides mission and development management for the Spartan family of carriers. These carriers provide an enabling orbital platform for Earth Science, Space Science, and technology validation experiments. Most variations fly aboard the Space Shuttle, although the Spartan Lite can be carried aboard an ELV. The Spartan family is envisioned as a major element of science activities aboard the International Space Station.

Activities	***Status***
•Transition responsibilities to Code 800	- Completed at GSFC reorganization 12/97.
•Develop Spartan Lite carrier	- CDR completed - Selected for Canadian Phase A study - Wallops to manage Mission #2 and follow-ons
•Develop Spartan Ground Station	- Wallops to develop if proposed by PI
•Support NASA AO's	- UNEX: 3 Spartan Lites, 4 Spartan 250 - MIDEX: 2 Spartan 400 - Discovery: 1 Spartan 400

Shuttle Small Payload Projects Office

The Shuttle Small Payloads Project manages engineering, integration, and operations for attached payload carriers that fly aboard the Space Shuttle in support of the Office of Space Flight. These carriers include the Space Experiment Module, Get-Away Specials, and Hitchhiker. Shuttle Small Payload Projects support the Space Science and Earth Science Enterprises, technology development, and educational activities.

Mission 2000 Related Activities	***Status***
•Transition responsibilities to Code 800	- Completed at GSFC reorganization 12/97.
•Transition SEM mission management to Wallops	- Wallops Mission Manager in place - Wallops personnel training ongoing - Supported quick action SEM-05 payload for STS-91 with payloads from Eastern Shore - SEM #3 carrier system being fabricated at WFF
•Transition GAS mission management to Wallops	- Wallops Mission Manager in place - Wallops providing Payload Tech. Manager on new P/Ls - Wallops providing lead on GAS documentation update - Wallops personnel training ongoing - Additional GAS positions to be filled

Unpiloted Aerial Vehicles

Mission 2000 Activities	***Status***
•Provide brokering services between PI and UAV providers	- Plan developed and briefed to Codes 170, 100 during 11/97 - Code Y directed lead center role to DFRC during 1/98
•Promote use of Wallops for operations	- 6 different RPV projects scheduled during FY98 (NASA and DoD)

Wallops Mission 2000 Key Element Status

PROGRAMS AND PROJECTS

Education/Outreach Activities	***Status***
•Retrain workforce for new responsibilities	- Technician retraining program established with UMES - Other initiatives being planned
•Establish new educational flight projects	- SubSEM pilot project launched for Code FE during 5/98 - Pilot project Freespace scheduled for 7/98 - 3 Code S Sounding Rocket & 3 Balloon student missions scheduled in FY98
•Support regional educational initiatives	- VA Spaceflight Academy to be conducted at Wallops 7/98 - UMES Bridge program at Wallops during June-July /98

Partnerships	
•Establish partnerships with organizations having common goals	- Wallops Partnership formed with tenant organizations. Charter signed 3/98. - MOU signed with UMES during 11/98

•***Business Management Activities***	***Status***
•Increase exposure of Wallops	- New web site established - Marketing materials being developed - Conferences attended - Visits to NASA field centers ongoing

Challenges

•Limited retraining budget and travel funds impacting transition schedule of Shuttle project responsibilities to Wallops.

•Inability to fill key Code 800 vacancies slowing new initiatives

•Phasing of CSOC, NSROC, and new initiatives create temporary skill gaps

•Academic training of technician workforce will take considerable time

•Abilities to convince NASA ELV and launch technology programs to use Wallops Test Range not as successful as hoped

•Financial sponsors for Launch Range and Research Airport needed

Ground Network Project
GSFC Code 452

Ground Network Project -- Code 452

(Mission 2000 - Wallops Orbital Tracking)

Recent Accomplishments of the Ground Network Project

Installation of antenna systems:

- Two 11-meter S/X-Band antenna systems one each in Norway and Alaska
- One 5-meter S-Band program track antenna system (LEO-T) at U. of Puerto Rico

Development and Modification of antenna systems:

- 90% completion of LEO-T at WFF
- 80% completion of Landsat Ground Station (LGS)
- 80% completion of MILA/BDA Reengineering (MBR)
- MIR VHF Air to Ground Voice system upgrades accomplished at WFF
- Completed Bermuda Phase down plan. Terminated S-Band operations at BDA.

Ground Network Project -- Code 452

(Mission 2000 - Wallops Orbital Tracking)

Future Goals of the Ground Network Project

- Complete LEO-T at WFF (July 1998); LGS (August 1998), and MBR developments (October 1998)
- Install LEO-T #3 in Alaska (August 1998)
- Terminate BDA C-Band operations. Maintain BDA UHF air-to-ground operations only.
- Complete transition of operations and maintenance to CSOC (October 1998)
- Address GN loading model and evaluate requirement to augment polar network with an additional antenna system and/or upgrades to McMurdo Ground Station (MGS)

Ground Network BACKUP Material

- 90% completion of LEO-T at WFF
  - Contract Awarded
  - Design Complete
  - Factory acceptance complete
  - Site acceptance outstanding
- 90% completion of Landsat Ground Station (LGS)
  - Contract Awarded
  - Design Complete
  - Installation Complete
  - Verification and Validation 80% complete.
- 80% completion of MILA/BDA Reengineering (MBR)
  - Design Complete
  - Installation 80%Complete
  - System testing 80% complete.

Observational Science Branch

Code 972

Staff:

15 Scientists
- 1 Resource Analyst
- 1 AETD Engineer

30 Contractors

1 Senior Visiting Scientist

4 Summer Interns

FY 98 Proposals:

Submitted - 8
Accepted- 2
Pending- 5

FY 98 Publications:

Submitted - 12
Accepted - 2
In Review - 10

Observational Science Branch

Mission 2000 Role

- Partner providing Scientific leadership, Requirements and Priorities for Aircraft Missions
- Customer for Range - Rockets and Balloons
- Help Develop and Provide Instruments for Aircraft Missions

Observational Science Branch

Laboratory for Hydrospheric Processes
Code 972

John Gerlach, Branch Head

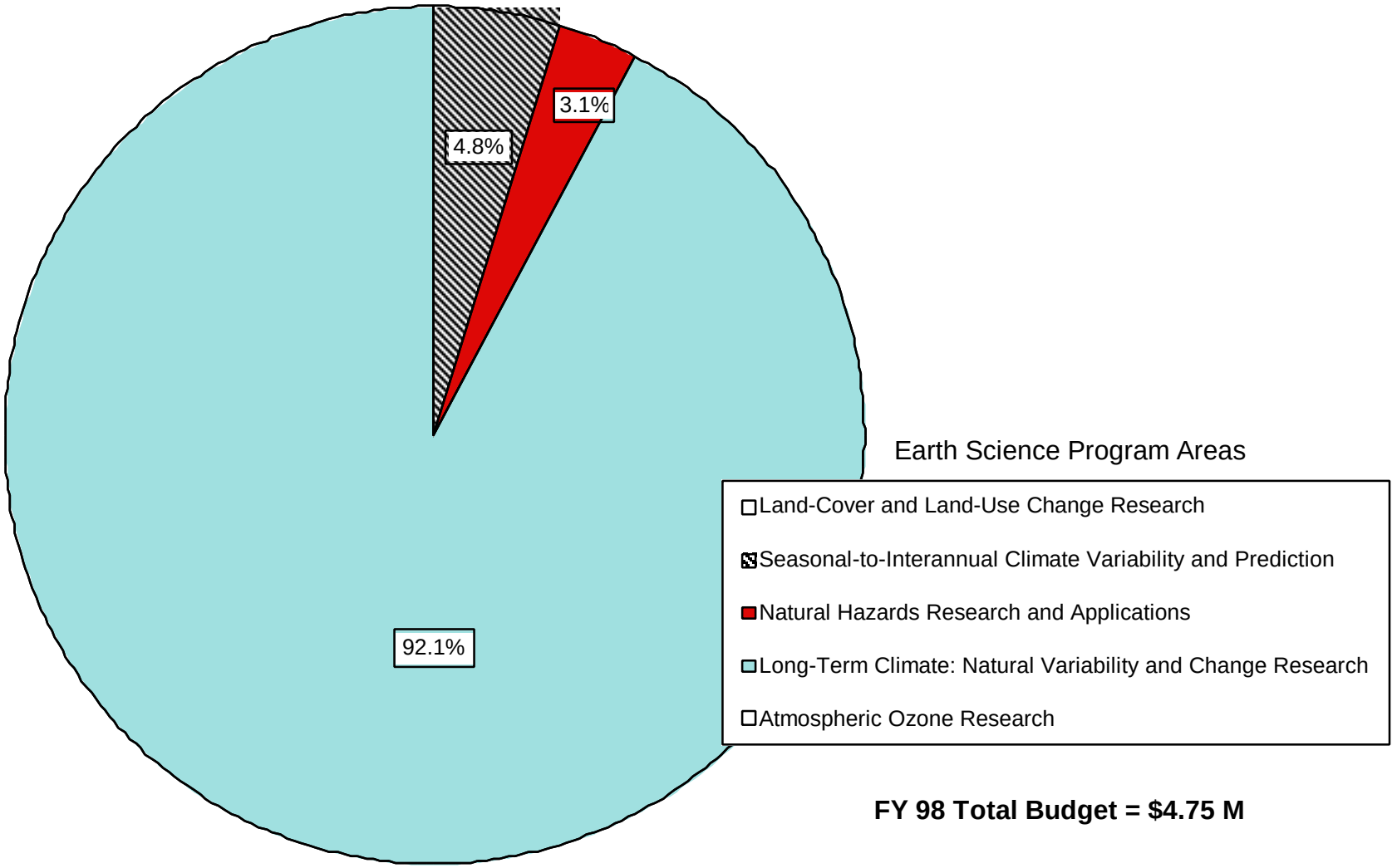
OSB Mission

•To conduct theoretical, experimental and applied research in the oceanic, atmospheric, and terrestrial sciences.

•To design, fabricate and operate both remote and in-situ sensing instruments for aircraft, balloons, and rockets.

•To plan and conduct laboratory and field measurements to improve the fundamental knowledge of the Earth and to evaluate remote sensor systems.

Observational Science Branch Customer Base



FY 98 Total Budget = $4.75 M

Observational Science Branch Unique Activities

291-07-04	EOS Validation
622-29-51	Met Sensor Calibration Facility
622-29-51	Satellite/Radiosonde Intercomparison
622-63-19	ECC Sonde Support
622-63-54	ECC Sonde Calibration and Launch
622-65-81	Measurement of Temperature and Winds
622-83-19	Greenland Field Experiments
622-83-20	GPS/Laser Altimeters
	National Park Service
	USGS
621-15-60	TRMM CAL/Val Support
621-15-70	TRMM Data Analysis
229-15-35	TPEM Jason-1 Satellite Proposal
229-15-75	Jason ADP
622-47-10	Microwave Radar Oceanic Investigations
622-47-13	Air-Sea Interaction Facility Support
622-47-14	Scanning Radar Altimeter
622-47-55	Hurricane Storm Surge
622-78-10	GPS Theoretical Studies
	ONR
229-15-77	GLAS Science Support
622-47-36	GFO/Data Processing
229-01-04	MODIS Science
229-71-04	MODIS Science Computing Facility
622-51-26	Oceanic LIDAR Operations
665-55-80	TOPEX Radar Altimeter
622-47-12	Rainfall on Microwave Return

Recent Accomplishments

- First measurements of rain-generated ring spectra accomplished.

- Pioneering measurements made of rain-induced gas exchange across an air-water surface.

- Seven (7) successful years of Greenland Ice Sheet airborne Laser Altimeter mapping accomplished at better than 10 cm accuracy. Eighth (8th) year deployment underway.

- Acquired airborne Laser Altimeter topographic data (<10 cm accuracy) of approximately 5000 kilometers of continental U.S. East and West coast beaches measuring coastal erosion as a result of significant weather storms and the El Nino effects of winter 97-98.

- Upgraded Kwajalein Island weather radar to dual polarization to provide “open ocean” in situ rainfall drop size distributions and better discrimination between water and ice in clouds for calibration/validation of TRMM instrumentation.

- Installed radar instrumentation (TOGA) on Chinese ship and participating in South China Sea Monsoon Experiment (SCSMEX) in support of TRMM.

- Demonstrated that optical properties of the ocean can be retrieved by linear matrix inversion of oceanic radiance models which is physics-based radiative transfer method expected to replace older empirical radiance ratio algorithms used on the Coastal Zone Color Scanner (CZCS) data to yield phytoplankton chlorophyll concentrations during the upcoming MODIS mission on EOS-AM.

- Conducted cooperative Airborne Oceanographic LIDAR experiments with the Shirshov Institute of Oceanography (Moscow, Russia) leading to refinements of instrumentation and methodology for measuring scattering properties using polarized lidar techniques.

- Development of next-generation Airborne Laser Altimeter Topographic Mapper, Airborne Oceanographic LIDAR, and Airborne Scanning Radar Altimeter.

- Six (6) successful years of TOPEX Radar Altimeter operations.

Future Plans

- Continued validation of SeaWiFS ocean color imagery with Airborne Oceanographic LIDAR.
- Extend linear matrix inversion of oceanic models to include absorption of the phycobili-pigments (phycourobilin and phycoerythrobilin) in addition to chlorophyll, chromophoric dissolved organic matter (CDOM) and total constituent backscatter (TCB) data products as part of MODIS Ocean investigation activities.
- Continued participation in Greenland Ice Sheet Airborne Topographic Mapping leading up to GLAS/ICESAT Mission.
- Preparation of GLAS/ICESAT Data Reduction Software.
- Scanning Radar Altimeter participation in cooperative NOAA hurricane induced storm surge investigations.
- Mars Global Surveyor Laser Altimeter data reduction and command operations.
- Continued participation in TOPEX Mission with Radar Altimeter support team.
- Participation in Instrument Incubator Program - two (2) proposals submitted.
- TRMM Science Proposal submitted for Air-Water Gas Exchange Investigation.
- Continued TRMM Calibration/Validation support.

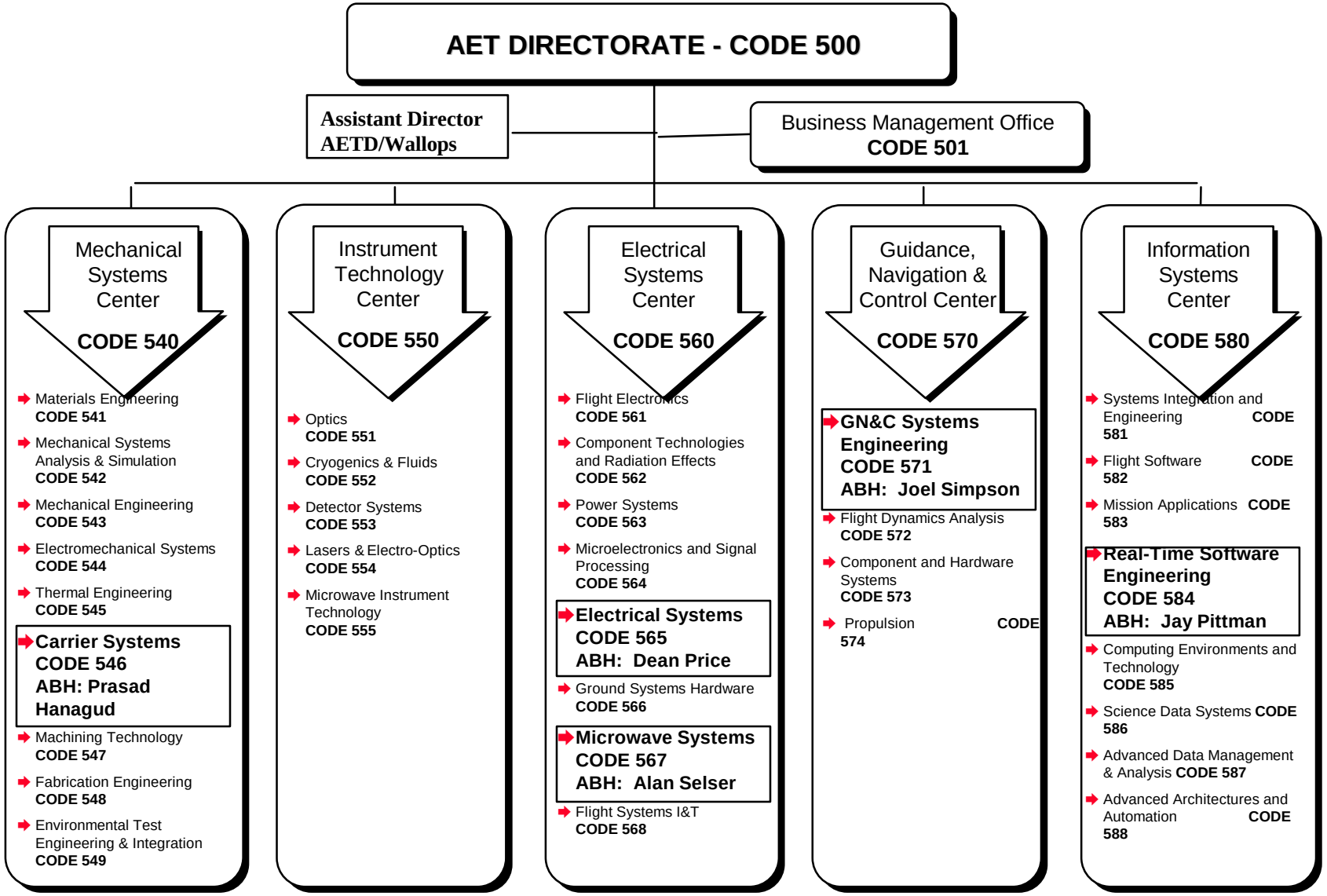
Issues

Continued routine access to low cost airborne platform mission support.

NASA
Goddard Space Flight Center
Enabling the "Reality of Tomorrow"

AETD ORGANIZATION

Applied Engineering and Technology Directorate



MISSIONS

- 546/CARRIER SYSTEMS BRANCH
  - Provides mechanical design, analysis, testing, and fabrication expertise for orbital andsuborbital flight projects.

- 565/ELECTRICAL SYSTEMS BRANCH
  - Designs and develops orbital, suborbital and carrier electrical systems. Develops mission critical range instrumentation systems by employing new technology insertion to meet the requirements of low earth-orbit and suborbital flight projects.

- 567/MICROWAVE SYSTEMS BRANCH
  - Develops and implements flight and ground communications components, subsystems, and systems in support of the tracking and data acquisition requirements of GSFC low earth-orbit and suborbital flight projects.

- 571/GN&C SYSTEMS ENGINEERING BRANCH
  - Provides technical expertise to customers in areas of GN&C Systems Engineering, flight dynamics analysis, GN&C components and hardware, and propulsion. Pursues technology development activities in support of NASA programs, industry partners, and universities.

- 584/REAL-TIME SOFTWARE ENGINEERING BRANCH
  - Provides expertise in the design, development, and evaluation of data systems and software for ground, flight, operational, administrative, simulation, and R&D purposes in support of GSFC Projects.

Wallops Mission 2000 Key Element Status

PROJECTS SUPPORTED	EXAMPLES OF SUPPORT
• Sounding Rockets	– Currently provide significant support of missions. Future support to consist of smaller levels of technology development.
• Balloons	– Support ULDB system development. Support balloon thin film material testing lab. Integration of Greenbelt/Wallops workforce provides expertise.
• Range	– Support Range Control Center upgrades, Mobile Range Control Center development, Range Safety, UAVs.
• Spartan	– Work closely with Greenbelt personnel in Codes 800 and 500 to develop future Spartan Lites.
• Shuttle Small P/L	– Support GAS/SEM transition. Developing SEM Ground S/W, partnering with schools to provide student testing.
• Ground Network	– Supported development of Low Earth Orbit Terminals. Worked with 581 to complete IP command/telemetry upgrades for Transportable Orbital Tracking Systems.
• Observational Science Branch	– Currently provide software support. Instrument development support to be provided in the future.
• Technology	– Working closely with Greenbelt GN&C personnel to perform GPS technology development, applicable for Sounding Rockets, Balloons, Range.

CHALLENGES

- CHALLENGE: Maintaining a viable workforce required to support Wallops Mission 2000. Skill mix problem exists due to shortage of engineers and particular areas of expertise.

  ACTIVITIES TO ADDRESS CHALLENGE:

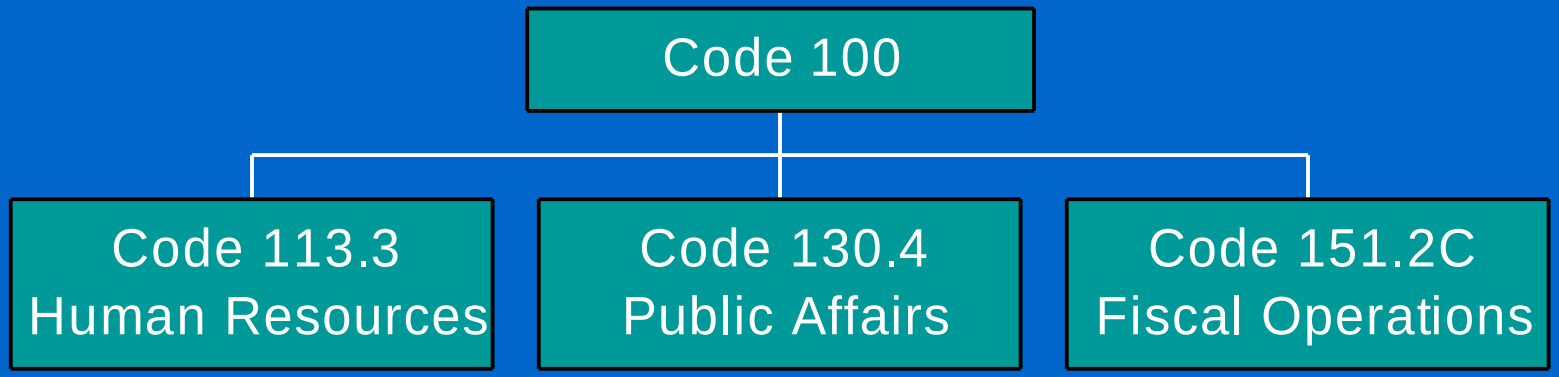
  - Continuing to work with customers to identify requirements of new work.
  - Integration of Wallops workforce with Greenbelt workforce continuing.
  - Multiple training efforts underway:
    - Technician Refocusing Initiative.
    - Coordinating training requirements to conduct training on-site.
    - Tools for Navigating Change
    - OJT
    - Computer-based training

- CHALLENGE: Continue to support work prior to transition of NASROC/CSOC/ODIN, while positioning ourselves to support new work.

  ACTIVITIES TO ADDRESS CHALLENGE:

  - Transfer work to contractor when possible.

Code 100 at Wallops



Code 113.3

- Staffing -- 2 Civil Service
- Specifically serves Code 800 and Code 200 co-located employees, but provides services to all employees
- Provides all human resources functions, except training
- Metric -- processes 230 actions annually

Code 130.4

- Staffing -- 2 Civil Service, 2 Contractors
- Serves all Codes at Wallops
- Metrics

	FY97	FY98 (Thru May)
News Releases Issued	23	17
National Stories	4	5
Educ./Public Outreach Prog.	109	163
Educational Programs	10	10
Visitor Center	46,750	15,030

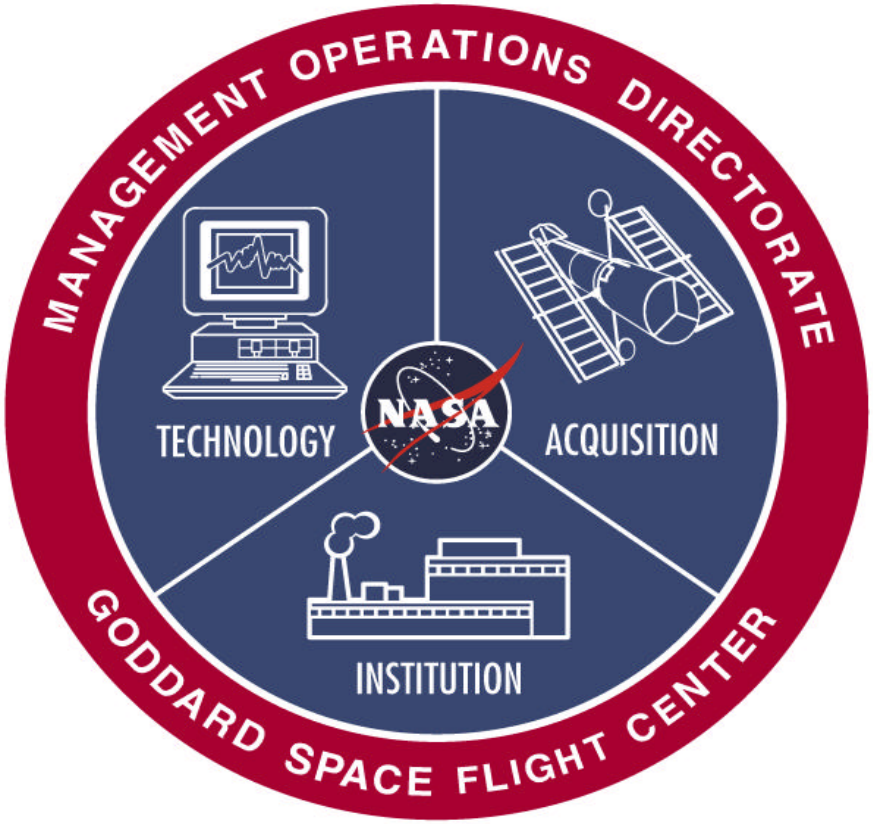
Code 151.2C

- Staffing -- 4 Civil Service, 2 Contractors
- Serves all Codes at Wallops
- Metrics

	FY97	FY98 (Thru June 8)
Travel Orders Processed	1,677	1,069
Invoices Scheduled for Payment	8,978	4,996

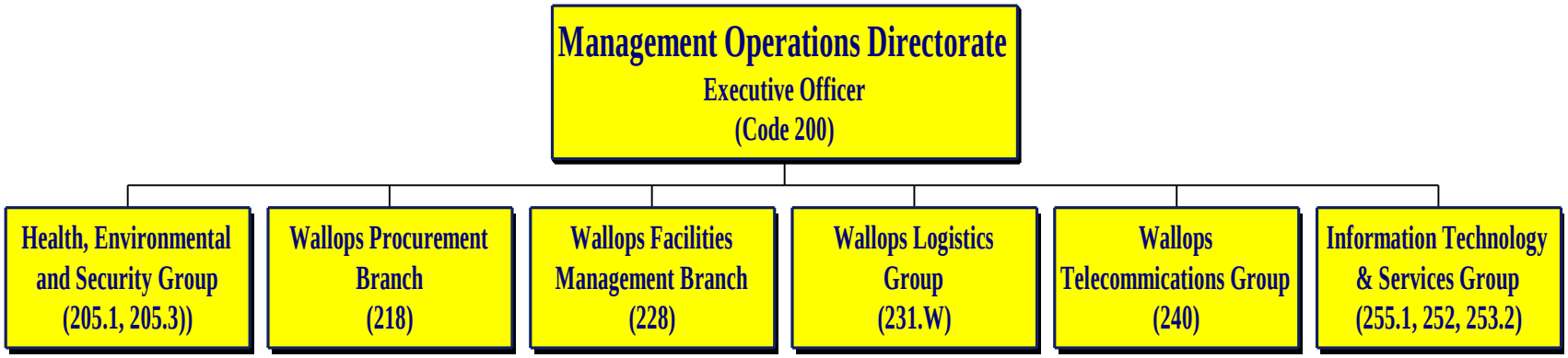
WALLOPS FLIGHT FACILITY

CODE 200 OVERVIEW



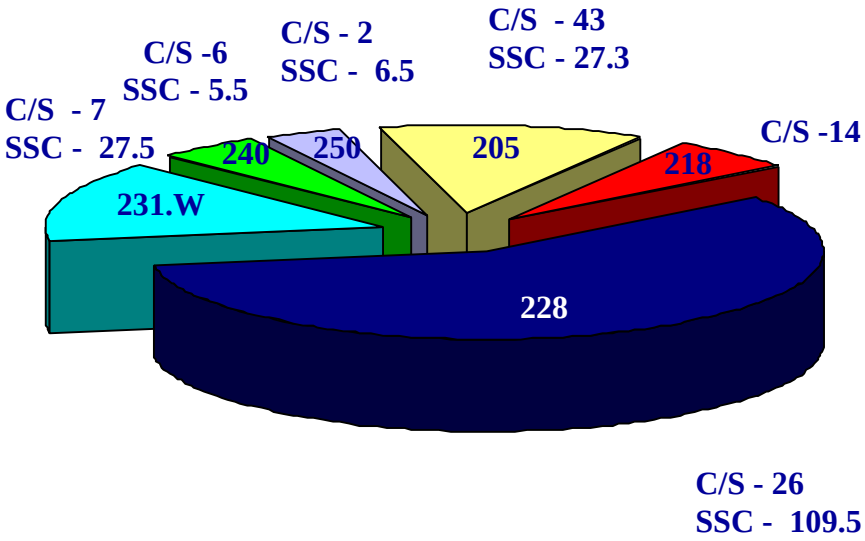
Pradeep Sinha
June 1998

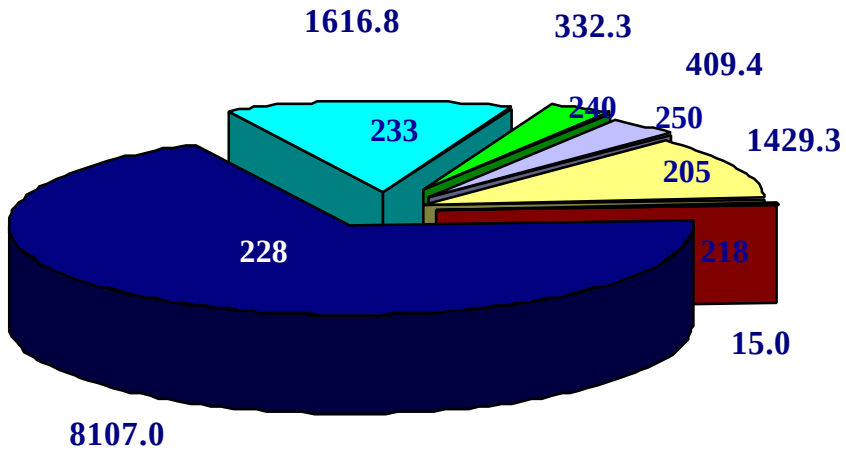
WALLOPS FLIGHT FACILITY



WALLOPS FLIGHT FACILITY

CODE 200 FY98 RESOURCES DISTRIBUTION





CIVIL SERVICE WYS - 59.0
CONTRACTOR WYS - 176.3

TOTAL BUDGET (K): $11,912.8

WALLOPS FLIGHT FACILITY

FY98 INTERGOVERNMENT INSTITUTIONAL SUPPORT

Department of the Navy	
• Aegis Combat Systems Center	**$5,278,708**
• Naval Surface Warfare Center	**$1,847,595**
Department of the Interior	
• Fish and Wildlife (Chincoteague Wildlife Refuge)	**$ 10,000**
• Assateague National Seashore (Park Service)	**$ 19,500**
National Oceanic and Atmospheric Administration	**$ 45,000**
United States Coast Guard	**$ 129,500**
United States Army Reserve	**$ 10,000**
Total	**$7,340,303**

WALLOPS FLIGHT FACILITY

ACCOMPLISHMENTS

- Participated in Developing Wallops Mission 2000 and Interagency Board of Directors
- Developed Environmental Assessment for Launch Range Expansion
- Awarded PBC Contracts for Balloon Program, and Facilities Maintenance, Operations and Construction
- Obligated 93% of FY97 CoF Program
- Implemented Reliability Centered Maintenance and Maximo Computerized Maintenance Management System
- Outreach Initiatives Included Donating Equipment Under Stevenson Wydler Program and Instituted Welfare to Work Program

WALLOPS FLIGHT FACILITY

CHALLENGES

- Accommodate Mission 2000 Requirements and Incorporate into Future Budgets
- Foster Development of BOD and other Partnerships
  - Expand Business Base
  - Distribute Institutional Cost
- Consolidated and PBC Conversion of Institutional and Program Support Services Including Award of NSROC
- Develop Wallops Facilities Master Plan
- Address National Priorities Lists Sites
- Develop Seawall Revitalization Strategy
- Maintain Civil Service Workforce